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Mineral Resource Inventory For Wyoming Uranium Resources

by: Paula Williams
Bureau of Land Management-Wyoming

Resources Development Internship Program
Western Interstate Commission for Higher Education

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MINERAL RESOURCE INVENTORY FOR WYOMING URANIUM RESOURCES

by
Paula J. Williams

Sponsored by
U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office
Cheyenne, Wyoming

Project Committee Members
Lewis Chichester
Dale Gobel

September 1975

Western Interstate Commission for Higher Education

Bureau of Land Management
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TABLE OF CONTENTS

ABSTRACT 1
ACKNOWLEDGEMENTS 2
I. WHY A URANIUM INVENTORY 3
II. INVENTORY PROCEDURES 3
III. DESCRIPTION OF PROJECT AREA AND URANIUM RESOURCES 4
IV. PROJECT FINDINGS 7
V. SUMMARY AND RECOMMENDATIONS 10
APPENDIX. 12
A. 3030 - MINERAL RESOURCE INVENTORY A-1
B. BIBLIOGRAPHY B-1
C. MAP OF URANIUM OCCURRENCES IN WYOMING . . . . . .

ABSTRACT

The Minerals Resources Inventory for Wyoming is a planning tool which is being compiled for the Wyoming State Office of the Bureau of Land Management. The purpose of this inventory is to gather and display all available information on the occurrences and value of public owned mineral resources under the jurisdiction of the BLM. This inventory is primarily based on library research rather than on field work. The inventory will be used in multiple use planning programs along with forest, wildlife, range, and other resource inventories.

The inventory system consists of a series of maps and mineral evaluation forms. The maps are BLM color quads, drawn on a scale of one-half inch to the mile. Mineral areas are plotted on Mylar overlays for each map. Each mineral area is keyed to an evaluation form which records basic data for that area and lists the sources of information. The inventory will be appropriately divided into four parts, and given to the four BLM district offices. The system is designed so that it can be easily updated.

The author has compiled an initial statewide inventory for uranium. This inventory has been hampered by the unavailability of information. Much of the published information on the locations of uranium resources dates from the late 1950s and early 1960s. The most recent information is kept confidential by uranium companies for competitive reasons. Consequently, the inventory is not as complete as it should be. More information is needed on the economic value of various mineral areas: this information is necessary to establish priorities, and to make comparisons with priorities for other resources in a given area. The four district BLM offices will have the responsibility of completing this inventory in greater detail.

ACKNOWLEDGEMENTS

This project was sponsored by the Bureau of Land Management in Wyoming and the Resource Development Intern Program of the Western Interstate Commission on Higher Education. I greatly appreciated their willingness to sponsor a Connecticut Yankee who had never before been to Wyoming. I think that it has been a valuable learning experience, both on and off the job.

I would like to thank the representatives of the various uranium companies who were kind enough to talk with me. A number of other people were very helpful in discussing my project: Harry Holden and William Prescher, of the Energy Research and Development Administration, Casper; Norman Denson, of the Uranium and Thorium Division, U. S. Geological Survey, Denver; Richard Kness, of the Bureau of Land Management, Buffalo; William Holsheimer, of the Bureau of Land Management, Lander; and Lewis Chichester, of the Bureau of Land Management, Cheyenne. Other help came from Bob Betrand, the research librarian at the Natrona County Library, Casper, and from Janet Engel, of the Bureau of Land Management, Casper, who did my typing. Most especially, however, I would like to thank Forrest Root, of the Wyoming Geological Survey in Laramie, and Dale Gobel, of the Bureau of Land Management in Casper. The two of them spent a great deal of time with me, providing much moral support as well as valuable guidance.

I. WHY A URANIUM INVENTORY?

The Bureau of Land Management in Wyoming has the responsibility of managing a wide variety of public-owned lands and resources. The BLM tries to accommodate a wide variety of public interests, and has adopted a policy of multiple-use planning. Saving wilderness areas is a valid objective, but so is encouraging uranium exploration and mining. In order to plan effectively for these different types of uses, the Bureau needs an accurate assessment of the resources available. Yet for years the BLM has been lacking in resource inventories for minerals, wildlife, and range, and the forestry inventory needs to be updated.

The minerals inventory was begun quite recently. Three types of minerals are being inventoried: coal, a leasable mineral; sand, gravel, clinker, and building stone, saleable minerals; and uranium, a locatable mineral. The compilation of these inventories is very time-consuming. It will probably take several years to finish the entire inventory. Hopefully the inventory will be updated as new information becomes available.

An inventory for uranium was especially needed because uranium is a growing concern in Wyoming. It is a concern economically: Wyoming has some of the largest uranium reserves in the nation and uranium is in growing demand for nuclear reactor fuel. The most recently published uranium inventory was released by the Wyoming Geological Survey in 1966, and thus is nine years old. In light of the extensive exploration in recent years, this is a serious time lag. Consequently the author was hired as a summer intern to work on updating this inventory and putting the information in a useable format. Regular, full-time Bureau personnel have too many other responsibilities (including writing environmental impact statements) to have much time for inventory work.

II. INVENTORY PROCEDURES

The Bureau of Land Management in Wyoming modeled its mineral inventory system on a plan used by the BLM in Nevada. A Bureau directive, 3030, was issued to outline the procedures for compiling the inventory. A copy of this directive is included in the Appendix. The author basically followed the suggested procedures, modifying them as necessary to accommodate the types of information available on uranium resources.

The uranium resources in the State are so extensive that there was only time enough to do a preliminary analysis of them. Thus the inventory is a broad overview of the situation, but not a "comprehensive reference." The mapped mineral regions were not classified on the basis of future potential. The inventory will need further work by district BLM personnel to distinguish "indicated mineral areas" from "mineral resource areas."

As specified, mineral areas were mapped on Mylar overlays for each

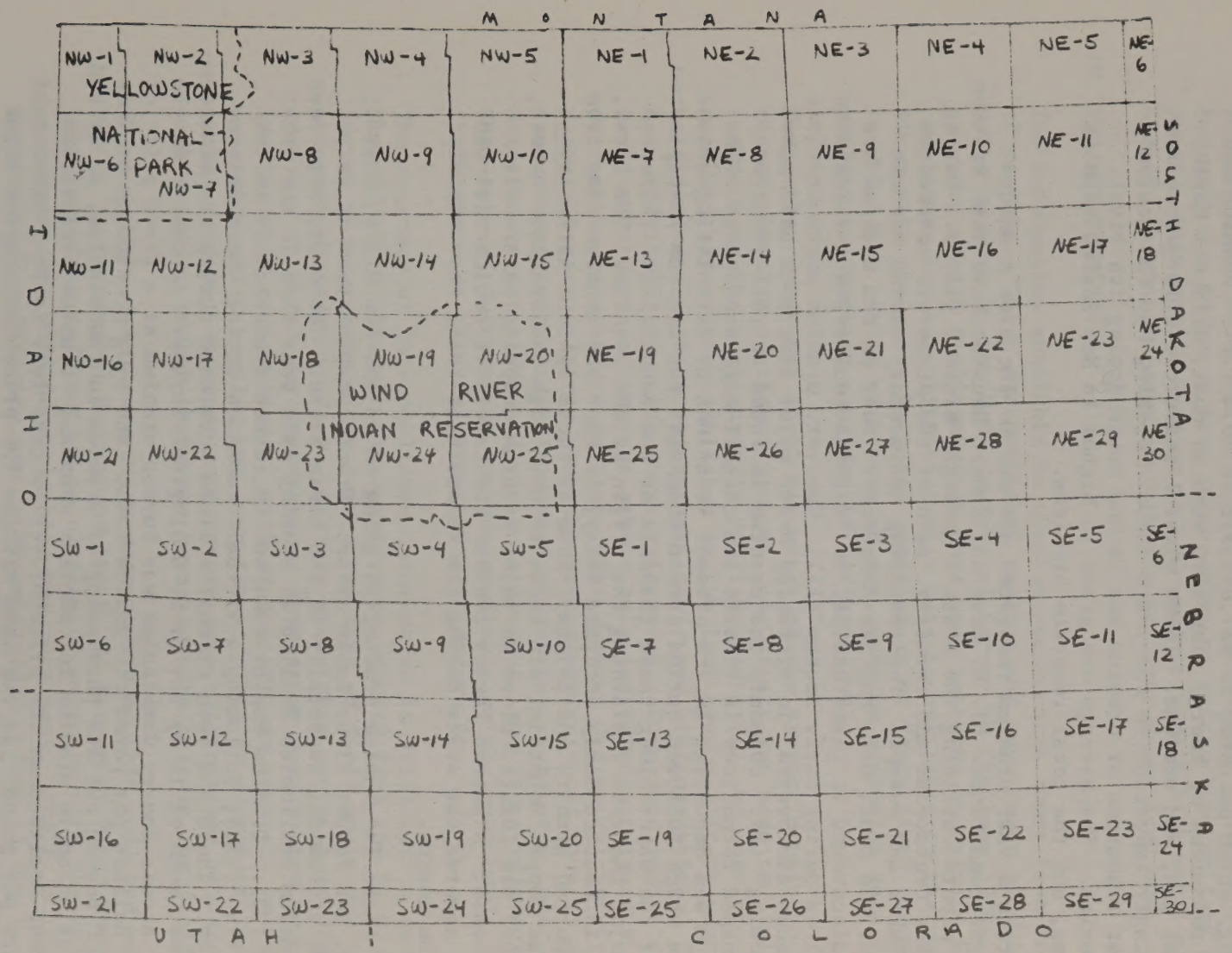
map. The maps were BLM surface management color maps, on a scale of one-half inch to the mile. There are 110 such maps which cover the State of Wyoming. They are numbered NE-1 to NE-30, SE-1 to SE-30, SW-1 to SW-25, and NW-1 to NW-25 as shown on the following page. The colors used in mapping uranium mineral areas were green, blue, and yellow rather than red. Patrick Canney was using red to map saleable mineral deposits, so it was decided that a different color scheme might reduce the confusion. Green designates information obtained from published sources. Dotted green outlines indicate mineral occurrences whereas solid green outlines show old and current mines. Colored solid green was used for known ore bodies, and hatched green areas for patented claims. Blue was used for information obtained from interviews with uranium companies: it designates areas in which the respective company has mining interests, has located claims, or owns property. This information varies in detail according to how much information the particular company official was willing to divulge. The areas colored solid yellow and outlined in black are granite igneous intrusions which have high uranium contents. These areas are included in the inventory since they may become sites of interest in the future. These areas are located in the southeastern portion of the Wind River Mountains, the Granite Mountains, and Copper Mountain.

A statewide summary map of uranium occurrences was also compiled. (A copy of this map is part of the Appendix.) Since this map was printed in black and white, a different scheme of symbols was employed, as indicated in the legend. The summary map has the advantage of being easily reproducible, whereas the book of 110 quad maps is not. Furthermore it is a useful index to the map book,since one can tell at a glance whether or not there is any mineralization in a given township, and then proceed to the map book for the information in greater detail. The map book is meant to be used with the evaluation forms to indicate further sources of information.

III. DESCRIPTION OF PROJECT AREA AND URANIUM RESOURCES

The uranium inventory covered the entire State of Wyoming, with the exception of Yellowstone National Park and the Wind River Indian Reservation. These two areas were excluded since the Bureau of Land Management has no jurisdiction in these areas. It was necessary to inventory most of the state since the BLM administers such a large part of it:

> The BLM has primary responsibility for about 17.5-million acres or 28 percent of the state and manages another half-million acres for other public agencies. It administers mineral resources reserved to the public under more than 13-million acres of privately owned surface. It also surveys, maintains land records and issues mineral leases relating to an additional 12.5-million acres otherwise administered by other federal agencies. In short, the



INDEX TO COLOR QUAD MAPS, WYOMING

Surface Ownership and Mineral Ownership

the BLM has some responsibility for about two-thirds of the land in Wyoming. (21)

Mineral resources have always been a vital part of the state's economy. Mineral leases and permits provide 89.7% of the BLM's income in Wyoming, which amounted to $27,059,772 in 1974 (21). Wyoming has large resources of energy minerals, such as coal, oil, oil shale, natural gas, and uranium. These mineral resources will become increasingly important in the years ahead. Wyoming has the nation's largest resources of uranium and is now outproducing its rival, New Mexico. The average ore grade is higher in New Mexico than in Wyoming, but the total reserves are less.

The state's vast uranium resources are due to the area's unique geologic conditions. J. D. Love and Robert Houston have both written short papers outlining the state's geologic history (11;F). During the late Cretaceous and Tertiary, much of the state was covered by huge lakes and swamps. The resulting sedimentary basins contain much of the coal, oil, and gas resources. Most of the uranium has been discovered in these basins, in "carbonaceous arkosic sandstones deposited during early Eocene"(11). However, uranium concentrations have been discovered "in virtually every major time rock unit known in Wyoming" (F). Commonly the uranium is found in roll-front or pod-shaped formations in fluvial and channel-edge sandstones. The uranium was deposited in its present locations by circulating ground waters which followed buried stream channels: the uranium precipitated out of the water along these channels at the boundaries. There are two major theories explaining the origin of the uranium. The first, which is most commonly accepted today, is that the uranium came from Precambrian granite intrusions. Some of these igneous intrusions, such as Copper Mountain, are known to have high radioactive counts, and they are located close to major uranium deposits in arkosic sandstones. A second theory credits the layers of radioactive ash which covered the state during the Cenozoic as being the initial uranium source.

Today there is uranium production going on in the Gas Hills, Shirley Basin, and Powder River Basin areas. Uranium exploration is very active statewide, especially in the basin areas. There are more feet of uranium drillholes drilled in Wyoming each year than in any other state (33). Uranium exploration has increased dramatically in the last five years, following a virtual cessation during the nineteen-sixties. There had been extensive field work done during the nineteen-fifties, much of it by the U. S. Geological Survey. At that time the U. S. Atomic Energy Commission was buying uranium at a fixed price of eight dollars per pound of "yellow cake," the U_3O_8 production product. The AEC phased out its purchasing of uranium in the sixties, as it had stockpiled ample uranium for nuclear weapons. Uranium exploration interest declined as the price of yellow cake fell to four-and-a-half dollars per pound. In the late sixties the price for uranium began

to rise as the demand for nuclear reactor fuel grew. Consequently, exploration efforts for uranium were reactivated. The "energy crisis" has accelerated this trend even further. As the price of uranium continues to climb, the areas of uranium exploration are being widened, and the state's estimates of uranium reserves and resources are being revised upwards. The current contract price for yellow cake range from twenty-five to thirty-five dollars per pound. Interest in uranium is expected to remain high until the breeder reactor is developed thirty or forty years from now.

IV. PROJECT FINDINGS

The information available on uranium occurrences comes from two types of sources. There are published reports and maps, many of which are based on work by the U.S. Geological Survey in the late 1950s. There are more recent findings which have been gathered by private uranium companies, but very little of this data is available to the public. Since this inventory is being compiled as an "open file" document to which the public will have access, uranium companies were not willing to disclose confidential information.

The author spent the first six weeks of the project mapping occurrences shown in published sources. An effort was made to limit this research to the most recently published material, because presumably maps and inventories published in the last ten or fifteen years would have included earlier research in their own bibliographies. There was some difficulty in using these references. Some maps indicated all uranium occurrences whereas others only indicated occurrences of 0.1 percent or greater ore content. The Wyoming Geological Survey Bulletin Number 50 gave a fairly comprehensive description of mineral areas, summarizing information from earlier sources as to area location, mineral content, types of minerals present, and other relevant facts. This type of information was not available on the maps used, nor was there space on the analysis sheets to record it.

The accuracy of this published information is difficult to ascertain. Many of the preliminary reconnaissance reports from the U. S. Geological Survey were written after just a few days of field work, and thus are not very detailed studies. Certain areas thus mapped have since failed to prove to be of any importance. Some areas were mapped merely on the basis of radioactivity, without any uranium minerals being present or perhaps with samples not even taken. This is a problem with current aerial radioactive maps: radioactive mine tailings may register as a weak anomaly, though there may be no uranium left in the field.

There will be some new uranium maps published this fall and winter. The U. S. Geological Survey and the U. S. Bureau of Mines have both been compiling information on uranium occurrences with the help of computers, and will be publishing separate maps. The U. S. Geological Survey will publish its map in November 1975. Some of the U. S. Geological Survey personnel objected to the BLM's Mineral Resources

Inventory. They saw it as a duplication of their efforts, which is in violation of the Interior Secretarial Order No. 29-48. Both the USGS and the BLM are sister agencies with the Department of the Interior, and the USGS has acquired most of the responsibility for geologic field work and mapping. The Energy Research and Development Administration, formerly the U. S. Atomic Energy Commission, will be publishing a nationwide map on uranium occurrences in January 1976. None of these government agencies wanted to release information on uranium occurrences prior to the publication of these maps. They all suggested that the most recent information could be obtained from uranium companies.

Interviews with uranium companies were interesting, though not too productive. Company personnel were usually willing to release information on company claims and property holdings, since that information was already public information. A couple of company managers stated that such information could only be provided by the corporation's president or board of directors. There was also a problem with areas where property was owned jointly by two or more firms. Often, in such a situation, material could not be disclosed by one company since it would violate contract agreements with the company's partner(s).

Uranium companies were not willing to explain where their exploration efforts are being concentrated. Some would only state an interest in the entire state or in all the basins in Wyoming. The uranium exploration business is highly competitive and therefore very secretive. The competitive nature of the industry is due to the laws under which it operates. Uranium is legally defined a "locatable" mineral and is governed by the 1872 mining law. Under the provisions of this laws, uranium claims can be staked on any property for which the federal government owns the mineral rights. The only exceptions are in areas which have been subject to mineral withdrawal, such as the National Parks, or Indian reservations, where the mineral rights belong to the Indian inhabitants and not to the federal government. The General Mining Laws of 1872 were written to encourage prospecting and to protect the interest of the prospector. "An individual may enter unreserved national resource lands to look for minerals, may stake as many claims as he chooses, and has limited rights of possession even without a patent -- as long as he diligently explores for or develops locatable minerals "(21). If the owner of the claims wishes to obtain further protection, he may apply to have his claims patented. This is a lengthy legal process, which must establish the absence of any valid conflicting claims. In a patented claim, the land surface is "conveyed to the claimant; the BLM then has little control over extraction methods or their effect on other resources" (21). Very few uranium claims in Wyoming have ever been patented, and those that have been are usually in areas where actual mining and production of uranium has occurred.

The reason that uranium companies try to keep their exploration efforts secret is that it would be detrimental to a company's interest to have its competitors staking claims in the same areas. If too many

companies own claims in an economically proven area, it may be that no one company would own enough of the area to be able to mine it profitably. Thus the companies are keeping this type of information confidential to insure their financial survival.

However, there are other reasons for restricting information to government agencies. Many of the companies fear further government regulation and interference with their operations. One company stated that it already had trouble trying to fulfill conflicting requirements on mining operations for four difference government agencies. This company certainly didn't want the BLM to draw up and impose its own set of regulations in addition to the current ones. Most of the personnel interviewed at various companies expressed concern that the Bureau would restrict exploration by withdrawing certain areas from mineral activity. It was feared that such withdrawals might occur if there were no mineral resources indicated in those areas at the present time. Such a move would be foolish, it was felt, because exploration efforts are constantly turning up new areas. Furthermore, as the price of uranium ore continues to climb, lower grade ores become economically acceptable, and the extent of uranium resource areas expands. Certain areas which are not of interest to uranium companies today may become so in the future.

The Bureau of Land Management does not foresee large-scale withdrawal of lands from mineral activity. However, in some instances this has already been done to protect other resources. One such example is the Oregon Trail, which is protected as a historic landmark. Any sections of the trail which contain uranium cannot be mined since the trail has been subject to mineral withdrawal. Another conflict arose in southwestern Wyoming, where the BLM planned a controlled grass plot study for an area in which a company was planning exploratory drilling. Fortunately in this case the company was able to discuss this problem with the BLM, and convince the BLM to move the site of the grass plot study.

This type of communication between the Bureau and uranium companies is very useful in promoting mineral interests. Hopefully the series of interviews made the uranium firms aware of the BLM's management plans. The BLM hopes to involve companies in the decision-making process by encouraging them to provide information on the location and economic value of mineral resources. Areas in which a firm has interests are noted on the evaluation forms. Thus in the future, the company can be contacted to attend pertinent public hearings and other meetings.

The information on company holdings and interests is extremely tentative, valid as of August 1975. Claims are often traded and sold: there is a rapid turnover of ownership, too complex to easily trace. The Waati Map Company in Casper, Wyoming, publishes yearly claim maps of various uranium districts in Wyoming. Claim information is also available in county courthouse records. However, it would be

very time-consuming to maintain such detailed information on claim ownership. There is a large number of mining companies which have uranium interests in Wyoming. Interviews were only conducted with fourteen companies, though letters requesting information were sent out to an additional eight.

V. SUMMARY AND RECOMMENDATIONS

The uranium inventory has adequate information compiled at this point to provide a good overview of Wyoming's resources. The primary sites of interest are easily identifiable: the Pumpkin Buttes, Southern Powder River Basin, Red Desert, Crooks Gap, Green Mountain, Copper Mountain, Gas Hills, Shirley Basin, and Black Hills. These areas currently have or have had mining operations. Consequently they should already be known to BLM minerals personnel in Wyoming.

However, the primary purpose of this inventory was to compile detailed information on occurrences of uranium. The amount of detail desired has been difficult to acquire, due to the inaccessibility of some of the data or the uncertainty of its accuracy. Due to the lack of time, the author has not been able to gather adequate information on the economic value of various mineral areas: there was only some mine production data obtained from the Wyoming Geological Survey. This economic information is needed to establish priorities. The four district BLM offices will be responsible for completing this inventory in greater detail. In one area office, Buffalo, Mr. Richard Kness is working on a more intensive inventory of uranium for the Black Hills district: his research involves a careful analysis of the geologic history and formations of the area, including much field work, a collection of production and reserve figures for old mines, and an extrapolation of this data to predict future mineral areas.

The need for detailed, accurate information in the inventory cannot be underplayed. If this is not acquired, the inventory will be worthless to BLM managers. Management decisions cannot be based on vague data. Consequently, it is of utmost importance to collect as much material from uranium companies as possible. Ideally I would recommend collecting information on a confidential basis: in actuality, this may be impossible due to the Freedom of Information Act. I would also recommend field verification of older, published reports of uranium occurrences: the constraint on this field work is primarily one of inadequate BLM funding, and secondarily, the overlapping of function with the U. S. Geological Survey.

It seems that, under "open file" conditions, the information acquired from uranium companies is not too useful. It would require a great amount of BLM man-hours to research and update claim ownership data: such an expenditure of time is far out of proportion to the value of such data. However, it does seem important for the Bureau to make the uranium companies aware of its inventory activities and to establish contacts for working together in the future on minerals problems.

Many of the problems in acquiring material from companies or published sources have been encountered in the coal inventory. Currently each of the Wyoming BLM district and area offices is working on a coal inventory for their respective regions. These problems may emerge in future mineral inventories as well. However a partial inventory is much better for management planning than none at all. Hopefully this inventory will be maintained and expanded so that it can be used as a management tool for a long time. With our nation's need for energy continually growing, uranium resources will become increasingly important. This development will have a big economic impact in Wyoming, as well as social and environmental impacts. With an adequate uranium inventory, the BLM will be able to plan for this growing importance of uranium resources, and adjust other priorities accordingly.

APPENDIX

A. 3030 - MINERAL RESOURCE INVENTORY
B. BIBLIOGRAPHY

3030 - MINERAL RESOURCE INVENTORY

.01 Purpose: This interim guidance is issued to describe the initial analysis of the Mineral Resource Inventory for Wyoming; to provide for a system of maintenance; and instructions for utilization.

.02 Objective: The objective of this inventory is to develop and maintain a systematic and comprehensive reference to and evaluation of public owned mineral resources under the jurisdiction of the Bureau. The use of the inventory and evaluation will serve as a foundation for improved resource management and will aid the Bureau in:

A. Reporting the location, value and potentialities of the public mineral resource.

B. Assessing the economic role of mineral development as a factor in the balanced usage of our public lands.

C. Timely identification of mineral resource potentials in advance of multiple use resource planning programs and to promote consistent and effective land classification decisions.

.03 Authority: The authority for conducting a mineral resource inventory is inherent in the Director's authority to prescribe records and systems for carrying on the program functions of the Bureau. The State Director has the authority to augment national policy under Bureau Order 701.

.04 Responsibility: The State Director is charged with the responsibility for conducting and coordinating the mineral resource inventory and evaluation program to conform with the intent outlined in the Bureau Manual. This release charges the District Manager with the responsibility of: maintenance, detailed studies as district programs require and utilization in program development and recommendations.

.05 Definitions:

A. Indicated mineral areas. Indicated mineral areas are lands possessing one or more of the following characteristics:

1. Actual or possible existence of locatable, leasable, or saleable mineral resources.

2. Active mining claims of known or presumed validity.

3. A concentration of mining locations, either past or present and possible existence of minerals by geologic features.

B. Mineral resource area. Mineral resource areas are lands under any jurisdiction whatsoever, provided title to the mineral estate remains in the Government, and where the lease or sale of minerals or transfer of the mineral title is administered by the Bureau. The principal characteristic of a mineral resource area is that it is or may become capable of beneficial use and development for mineral production within a reasonable future period, according to the nature of the mineral commodity concerned.

.1 The inventory system:

A. The color series 1/2-inch to the mile scale maps have been adopted as the base maps for the inventory. These should be maintained in a single binder for each district.

B. Overlays. A Mylar/acetate overlay is attached to each map on which indicated mineral areas and mineral resource areas are outlined in red and colored solid red, respectively. Each area is assigned a number prefixed by the quad map letters. When an area embraces land within more than one quad map, the first number assigned will be maintained throughout. It may be useful to break some of the more extensive areas at the color quad boundary.

C. Indicated mineral resource area identification and evaluation -

The attached form (appendix 1) is used for the recordation of all the basic data for an individual indicated mineral area. It is referenced to the maps by the prefix letters, the map number and the mineral area number. The form can be reproduced on standard office equipment for cross filing, commodity studies, coordination and maintenance of the system.

1. Land Description

Identification of the county, approximate land description and mining district are major features of the form.

2. Class of Deposit

Boxes are provided for indicating the class of deposits known or thought to exist within the indicated mineral area, i.e., locatable lode, placer, leasable and saleable.

3. Principal Valuable Constituents Identified

Space provided under this heading is designed to indicate the principal mineral or metals found in the indicated mineral area and to rate their importance by value of production to date. (The commodity which has or could be expected to yield the greatest return in value to the miner is assigned 1, and the next most important 2, etc.)

4. Value of Production

The value of past production is indicated by checking the appropriate box in this section.

5. Analysis and Evaluation

This portion of the form is designed to furnish an appraisal of future potential of the area for mineral production and to furnish reasons why the area was designated as an indicated mineral area.

6. Comments

Under this section of the form, space is provided for comments such as the name and address of operators, comments obtained from interviews with operators, outline of sources of unpublished information, etc. A blank is provided to indicate whether or not other Bureau programs are expected to be in conflict with mineral development activities.

7. Principal References

Principal published sources of information are listed in this section. Each should be described as to its content and value in the study of the area.

8. Date Line

Each time the form is changed through addition of new information and/or revisions of the map due to field study, the date and initials of the person making the changes should be added to the lower portion of the form.

9. File Folders

A file folder should be maintained for each quad map in the mineral inventory map atlas. Additional notes and maps obtained through interviews or field examination, etc., should be filed in the folder along with the forms for the specific indicated mineral area or mineral resource area.

D. Minerals Library

As a minimum each District should maintain a reference library of all references listed. State Office mineral personnel will attempt to obtain copies of all available pertinent publications and will order sufficient copies for the District libraries. Generally, District Managers should make requests for any data which they lack to the State Office so that orders can be consolidated.

E. Maintenance

1. District Office Staff

This initial analysis does not generally include consideration of on-the-ground activity which is seldom reflected in publications. Therefore, all District personnel must be alert to observing and reporting mineral exploration and mining claim locations when observed in the field. One method of obtaining indications of current activity would be to scan the current assessment work recording index in the County Recorder's Office. If and when this is done, the inventory maps and forms should be taken to the Recorder's Office so that locators' names and addresses can be noted in the comment section of the forms. This would be one method.

Perhaps the best method of keeping abreast of mineral interest is to make notes of new areas of claim staking or other mining activity noted in the field during other work assignments. This would include interviews with persons engaged in mineral exploration activities. Notes should be filed in the inventory file folders. The important thing is to get the information into the folder so that management decisions can be made with the most up-to-date minerals information possible.

2. Mineral Reports

Upon approval of mineral reports the State Office staff will initiate any changes in the inventory system that are necessary. Mineral reports will be filed in the township and range file and referenced on the forms. District minerals personnel should review the township and range file to assure themselves that this information is adequately incorporated in the inventory system.

F. Utilization

Designation of indicated mineral areas or mineral resource areas are not classification actions or validity determinations, but are only informal opinions of where mineral lands or concentrations of mining claims may be found, or where valuable mineral deposits are likely to occur. Public lands outside of indicated mineral areas cannot be assumed to be nonmineral lands or to be free of mining claim conflicts, since this inventory is essentially a library-orientated study and will not usually reflect mining location activities. A nonmineral classification is in itself a positive classification that can be made only after field examination or by report from the Geological Survey. This mineral inventory does not replace the Bureau's dependence upon the United States Geological Survey for their report on leasable

minerals or advice on mineral character of lands prior to disposal. However, district personnel should check the mineral inventory for possible mineral conflicts prior to initiating field investigations on title transfer actions even though a report by the United States Geological Survey may say the land is nonmineral.

All resource planning should include a study of the mineral inventory. When conflicts exist, minerals personnel should be asked to give a thorough evaluation of the area under study including on-the-ground investigations.

1. Public Use

Information contained in this inventory will be made available to the public; however, when the public is given access to the mineral inventory it should only be done in the presence of an employee who is thoroughly familiar with the system and its use. A danger of misunderstanding the purpose and functions of the inventory by the public exists which could result in severe criticism of the Bureau and its programs unless its sources and function are properly understood. Essentially it is important to make clear that the inventory system is primarily designed as a land management reference tool developed principally from published sources and that it is not related to mineral character classification or mining claim validity determinations. We should also gather information from the public for possible inclusion into our inventory. Often such people can give information on areas that have not been identified in the inventory because there is no published information nor field information. They may also be willing to give private reports on geology and/or mineral evaluations or offer verbal information which may become valuable additions to the inventory.

INDICATED MINERAL RESOURCE AREA IDENTIFICATION AND EVALUATION

County: _____ Identification No: _____

Township: _____ Range: _____

Mining District: _____

CLASS OF DEPOSIT: Locatable lode (___), Placer (___); Leasable (___), Salable (___)

PRINCIPAL VALUABLE CONSTITUENTS IDENTIFIED:

Gold	___	Titanium	___	Mercury	___	Diatomite	___
Silver	___	Tungsten	___	Fluorspar	___	Gypsum	___
Lead	___	Molybdenum	___	Barite	___	_____	___
Zinc	___	Uranium	___	Oil and Gas	___	_____	___
Copper	___	Antimony	___	Building Stone	___	_____	___
Iron	___	Beryllium	___	Sand and Gravel	___	_____	___

VALUE OF PRODUCTION: Negligible: ___ Over $100,000 ___ Over $10,000,000 ___

ANALYSIS AND EVALUATION:

Area contains one or more active mining operations or is the scene of active prospect or exploration activity. ___

Area is classified by the U.S.G.S. as being prospectively valuable for leasable minerals. ___

Area is included in this inventory on basis of favorable geologic conditions. ___

Area manifests none of the above but is heavily staked with mining claims (___); or Bureau files indicate possible mineral in character classification (___).

Potential of area for discovery of valuable mineral resources in the foreseeable future is: Excellent (___), Good (___), Fair (___), Poor (___).

COMMENTS: It is possible this area will conflict with other management programs in the foreseeable future. ___

Other: _____

_____

_____

_____

_____

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REFERENCES:

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Reviewer Date

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This intern report was read and accepted by a staff member at:

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This report was completed by a WICHE intern. This intern's project was part of the Resources Development Internship Program administered by the Western Interstate Commission for Higher Education (WICHE).

The purpose of the internship program is to bring organizations involved in community and economic development, environmental problems and the humanities together with institutions of higher education and their students in the West for the benefit of all.

For these organizations, the intern program provides the problem-solving talents of student manpower while making the resources of universities and colleges more available. For institutions of higher education, the program provides relevant field education for their students while building their capacity for problem-solving.

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